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REMARKS

1. The specification has been amended to remove Example 1 from the scope of the invention. As no new matter has been introduced by the amendment, it is respectfully submitted it should be admitted.

2. Claim 1 has been amended to more clearly point out and distinctly claim the invention. Support for the amendment is found at P.1, lines 11-16; P.3, lines 11-20; P.4, lines 5-9; P.5, lines 18-25; Examples 2-5; and paragraph bridging pages 5 and 6. As no new matter has been introduced by the amendment, it is respectfully submitted it should be admitted.

3. New claims 14 and15 have been submitted to claim all that to which the inventor is entitled. Support for claim 14 is found in Example 3. Support for claim 15 is found at P. 3, lines 18-20. As no new matter has been introduced by claims 14 and 15, it is respectfully submitted that they should be admitted.

4. Claims 1-3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Queen et al (US 5,567,256) in view of Stahlecker et al. (US 4,495,758) and GB 2,205,116 A. Queen et al. is relied upon as disclosing a process of making blended yarns containing heat-activated adhesive and base fibers for carpets. Stahlecker et al. is relied upon as disclosing a blended binder/base yarn using a wrap spinning method. GB 2,205,116 is relied upon as disclosing wrap spinning and heat activation of a blend of binder fibers containing heat-activated adhesive and base fibers to stabilize a blended carpet yarn.

The invention as presently claimed is a process for producing plied tufting yarns by twisting and heating two or more ring spun or wrap spun yarns. The ring spun or wrap spun yarns are formed by ring spinning or wrap spinning a base fiber bundle (not containing heat activated adhesive material) with a second fiber comprising a heat-activated binder material. The ring spinning or wrap spinning places the heat-activated binder fibers uniformly and continuously around the base fibers during twist insertion or wrapping to form the spun yarn. These yarns are then plied, followed by a heating step.

It is submitted that the process of the invention differs from the prior art of producing plied tufting yarns by the inclusion of the underlined step.

The present process differs from Queen et al. (US 5,567,256) in several respects. As Examiner has noted, Queen et al. does not disclose ring spinning or wrap spinning of its yarns. Moreover, in Queen et al. each of the yarns to be plied to form the final carpet yarn consists of a single yarn component, i.e., a blend of base fibers and low melting material. "Blending" means that the low melting material is randomly dispersed in the base fibers. In the present invention, the ring spun or wrap spun yarns have two distinct yarn components – a first fiber bundle consisting essentially of base fibers and a second fiber which comprises heat activated binder fibers. While the second fiber may consist of a blend, the first fiber bundle and the second fiber are not blended with one another but maintain their separate identities in the ring spun or wrap spun yarn.

Stahlecker et al. (US 4,495,758) describes a process for producing wrap spun yarn, but provides no disclosure or suggestion that the wrapper yarn may contain a heat activated binder material. It is respectfully submitted that Stahlecker et al. fails to suggest that the core yarn and the wrapper yarn can differ in any respect.

GB 2,205,116 A discloses a carpet yarn having only one yarn component consisting of a blend of a base fiber (wool) and a heat activated bonding agent. "In use with a bonding agent consisting of bonding fibres, the dispersion of the bonding fibres among the non-adhesive fibres can be achieved by conventional textile blending techniques." (P.6, lines, 3-6, emphasis added) This is followed in GB 2,205,116 A, P.6, lines 6-11, by a distinction between "blending" and techniques of processing the blend to form yarn, including wrap spinning. There is no suggestion that the core yarn and the wrapper yarn may or should have different compositions. Neither Queen et al. nor GB 2,205,116 teaches a method of forming a yarn containing two distinct yarn components.

In view of the foregoing, it is respectfully submitted that there is no motivation to combine Queen et al. with Stahlecker et al. and GB 2,205,116 A other than with the impermissible use of hindsight in view of the present application. One of the tests for whether a combination of references is appropriate is the following:

> The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art,

> not in the applicants disclosure. *In re Vaeck,* 947, F.2d 488, 20 USPQ2d 1438, (Fed. Cir. 1991).

It is respectfully submitted that the references cited fail the test of *In re Vaeck* and therefore a *prima facie* case of obviousness has not been established.

To further illustrate the differences between the present invention and Queen et al., Stahlecker et al. and/or GB 2,205,116 or their combination, the attached figures 1 and 2 show the steps of the several processes. It is seen that neither the Queen et al. or GB 2,205,116 processes, or their combination using the wrap spinning method of Stahlecker et al. will result in a first base fiber bundle that is wrap spun or ring spun with a second fiber comprising a binder material.

It is respectfully submitted that the combination of these references fails to teach each and every limitation of claim 1, as amended, of the present invention and that therefore, a *prima facie* case of obviousness has not been established. It is earnestly requested that this rejection be withdrawn.

> To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka, 490 F.2d 981, 180 USPQ 494, 496 (CCPA 1974).*
> If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988).*

5. Claims 1-3 stand rejected under 35 U.S.C.§103(a) as being unpatentable over Lofquist (US 5,478,624), in view of Stahlecker et al. (US 4,495,758), Scott (US 4,668,552) and Queen et al. (US 5,567,256). Lofquist is relied upon as teaching a blended yarn comprising a base fiber and a binder fiber. Stahlecker et al. is relied upon as disclosing a wrap spinning method. Queen et al. is relied upon as showing that the base fibers are reinforced and strengthened by the melted binder fibers. Scott is relied upon as showing the desirability of uniformly spirally wrapping binder fibers around a core strand.

Attached are Declarations under 37 C.F.R. §1.132 by Mr. Charles E. Bowers of Honeywell International Inc. and Prof. William Oxenham of North Carolina State University. As the Declarations present facts related to the fibers of Lofquist cited in the Office Action, it is respectfully submitted that they should be admitted.

Examiner has summarized the disclosure of the Lofquist method with emphasis on step b), i.e., *blending* the bulk base fiber with heat-activated binder fibers "*via conventional means such as commingling* to form a blended yarn...." However, the Examiner has admitted that Lofquist does not expressly teach using either a ring spinning or wrap spinning technique in forming the blended yarn. Key to the Examiner's reasoning in rejecting the instant invention is his finding that "blending by conventional means" includes processes such as ring spinning and wrap spinning. The basis for this finding is stated as follows "...it is well known in the art of making yarn to form a *blended* binder/base yarn using a wrap spinning method as disclosed for example by Stahlecker et al (emphasis added)." However, close examination of Stahlecker et al. fails to reveal the terms "blend", "blending", "blended" or other variant of "blend". Stahlecker et al. therefore provides no support to the proposition that wrap spinning is a well known method of blending.

Evidence of what the man of ordinary skill in the art understands by the statement in Lofquist "blending by conventional means" is submitted as follows:

- In the "Dictionary of Fiber & Textile Technology", Hoechst Celanese Corp., Charlotte, NC 1978, the term "blend" is defined as, "A yarn obtained when two or more staple fibers are combined in a textile process for producing spun yarns (e.g., at opening, carding or drawing). The term "blending" is defined as the combining of staple fibers of different physical characteristics to assure a uniform distribution throughout the yarn. (Copy attached).
- In "The Modern Textile and Apparel Dictionary", Fourth Revised Enlarged Edition, G.E. Linton, Ed., Textile Book Service, Plainfield, NJ 1973, the term "blend" is defined as, "A term used to describe a yarn obtained when two or more fibers are combined in the spinning process." The term "blending" is defined as "The combining of fibers of different colors such as heather-mixture, or of different types of fibers such as cotton or wool before spinning." (Copy attached).
- The Declaration of Prof. Oxenham states, "In my opinion, ring spinning or wrap spinning are not means of "blending" as that term would be understood by one of ordinary skill in the textile arts."

The process of Scott (US 4,668,552) is illustrated in the attached Figure 3. The inventive process differs fundamentally from that of Scott as follows:

- The inventive process produces a plied tufting yarn suitable for insertion into a backing material in the manufacture of tufted carpeting. The process of Scott entirely bypasses the production of a tufting yarn and a tufting operation but instead prepares a special yarn from a base fiber wrapped with a texturized binder fiber. This yarn is woven into a special fabric that is cut along a median plane to produce a carpet.
- The plied yarn in the inventive process is heated to melt the binder fiber thereby producing a tufting yarn with the binder in position around the base fibers providing radial constraint to the base fibers. In Scott, when the fabric is cut, so too is the binder fiber. When the fabric is heated, the binder fibers are free to shrink inward away from the face of the pile providing no radial constraint to the base fibers.
- The inventive process includes a ply twisting step not included by Scott.

It is seen that the process of Scott is incompatible with the present invention and incompatible with the processes of Lofquist and Queen. The man of ordinary skill in the art would not and could not combine Lofquist and/or Queen with Scott. In view of the foregoing, it is respectfully submitted that there is no motivation to combine Lofquist with selective aspects of Stahlecker et al. Scott and Queen et al., other than with the impermissible use of hindsight. Moreover, this combination fails to teach all of the limitations of the present invention. It is respectfully submitted that a *prima facie* case of obviousness has not been established over claim 1, as amended.

It will be readily appreciated that the problem of producing carpet yarns that have excellent wear resistance, superior tuft definition, more uniform appearance, firmer carpet feel and greater resistance to shedding has been a problem of long standing. Earlier attempts at solving this problem such as Lofquist, Queen and Scott represented advances in the art but did not meet all of the needs satisfied by this invention.

The instant patent application discloses novel means of addressing the problem. Mr. Bowers' Declaration makes clear the reason why the inventive yarns indeed show superior performance in carpets compared to the prior art Lofquist yarns.

It is earnestly requested that this rejection of claim 1, and to claims 2 and 3 dependent thereon, be withdrawn.

6. Claims 1-3 stand rejected under U.S.C.§103(a) as being unpatentable over Stahlecker et al. (US 4,495,758), in view of Lofquist (US 5,478,624), Queen et al. (US 5,567,256), GB 2,205,116 A, and Scott (US 4,668,552). Stahlecker et al. is relied upon as disclosing a method of making a blended yarn by wrap spinning. Queen et al. is relied upon as disclosing making blended yarns for carpets by spinning cotton fibers and heat activated binder fibers to form blended yarns and then melting the binder fibers. Scott is relied upon as showing the desirability of uniformly spirally wrapping binder fibers around a core strand.

Close examination of the Stahlecker et al. reference fails to reveal the terms "blend", "blending", "blended" or other variant of "blend". Stahlecker et al. therefore provides no support to the proposition that wrap spinning is a method of making a blended yarn. The "Dictionary of Fiber & Textile Technology", Hoechst Celanese Corp., Charlotte, NC 1978, The Modern Textile and Apparel Dictionary", Fourth Revised Enlarged Edition, G.E. Linton, Ed., Textile Book Service, Plainfield, NJ 1973, and the Declaration of Prof. Oxenham discussed in paragraph 5 of this response is evidence to the contrary.

The differences between the present invention and the disclosures of Lofquist, Queen et al., GB 2,205,116 A, and Scott, and their combination with Stahlecker et al., have all been discussed in the preceding paragraphs 4 and 5 and are illustrated in the attached Figures 1-3. The process of Scott is seen to be fundamentally incompatible with the present invention and with those of Lofquist, Queen, and GB 2,205,116A. It is respectfully submitted that that there is no motivation to combine Stahlecker et al. with selective elements of Queen et al., GB 2,205,116 A, and Scott, other than with the impermissible use of hindsight. Moreover, this combination fails to teach all of the limitations of the present invention. It is earnestly requested that this rejection of claim 1 and to claims 2 and 3 dependent thereon be withdrawn.

7. Claims 1-3 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 16, 18 and 21 of co-pending application No. 08/933,822. As none of the relevant claims of either application has yet been allowed, Applicant will defer proffering a terminal disclaimer in this case.

8. In light of the foregoing amendments and remarks, is it submitted that the claims now of record, i.e. claims 1-3, and new claims 14-15, are allowable and should be passed to issue. Applicants respectfully request the same.

The Examiner is invited to call the undersigned attorney if there are any unresolved issued to discuss same.

Respectfully submitted,
Charles Edward Bowers

By Virginia Szigeti (Andrews)
Virginia Szigeti (Andrews)
Applicants' Attorney
Reg. No. 29,039

I hereby certify that this correspondence is being deposited with the United States Patent & Trademark Office via facsimile to Examiner Sam Chuan C. Yao, Group Art Unit 1762, at 703-305-7115 on August 14, 2003.

Virginia Szigeti (Andrews)
Virginia Szigeti (Andrews)

FIGURE 1

INVENTIVE PROCESS

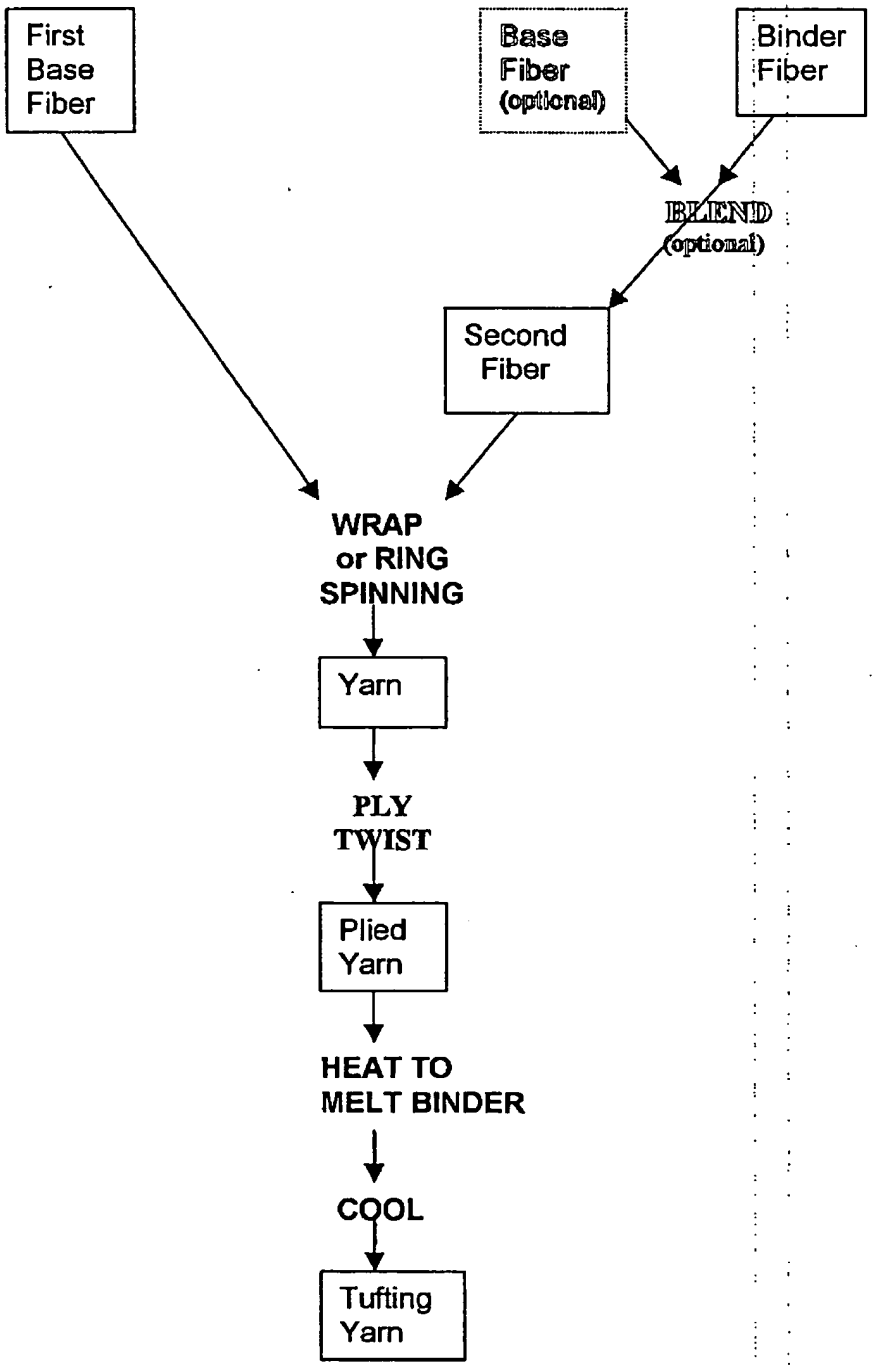


FIGURE 2

PRIOR ART PROCESSES OF QUEEN ET AL. AND GB 2,205,116 A

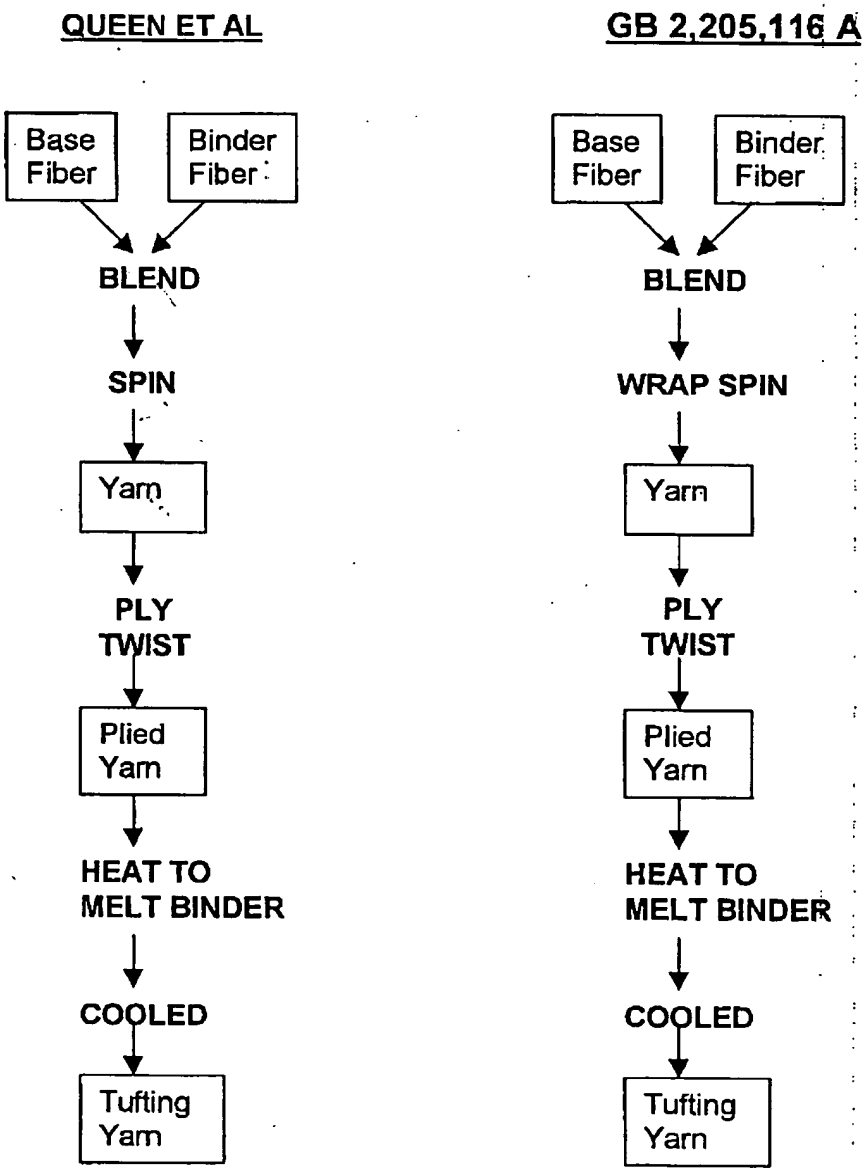
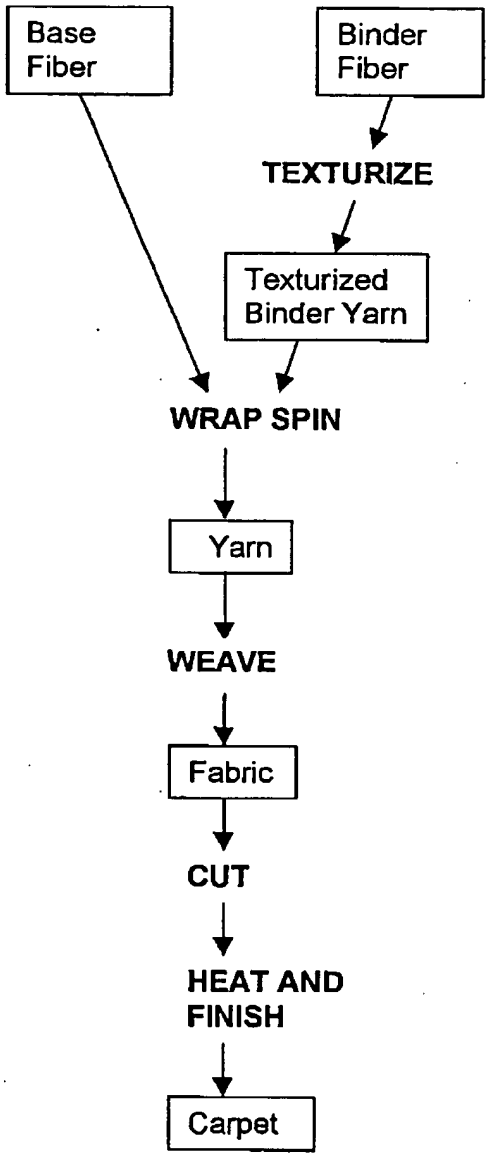


FIGURE 3

PRIOR ART PROCESS OF SCOTT (US 4,668,552)



DECLARATION UNDER 37 U.S.C. 1.132

I presently hold the position of Senior Specialist – Fiber/Yarn Processing Technologies in the Specialty Materials sector of Honeywell International Inc. I received a Bachelor of Science degree in Textile Technology from North Carolina State University and have been employed in the fiber industry for thirty-five years. Twenty-nine of those years, I have worked primarily with carpet yarn spinners and carpet manufacturers. My responsibilities include the development and evaluation of carpet yarns as well as providing technical expertise in the production of carpet yarns. I have been an invited lecturer at meetings of the American Yarn Spinners Association, the Carpet and Rug Institute, and at universities.

I have been asked to comment on the relationship of the carpet yarns of Serial Number 09/143,583 to those of Lofquist (U.S.P. 5,478,624).

I am very familiar with the carpet yarns of Lofquist. The carpet yarns of U.S.P. 5,478,624 are produced by my company and was an industry leader in residential carpet yarn during the period 1994 to 1997. I have dissected these yarns and evaluated carpets prepared from these yarns on many occasions.

The carpet yarns of Lofquist consist of carpet fibers such as nylon-6 and poly(ethylene terephthalate) (PET) locked together by heat activated binder fibers randomly positioned throughout the yarn. In contrast, the inventive carpet yarns of Serial Number 09/143,583 are comprised of carpet fibers locked together under radial constraint by heat activated binder fibers uniformly spaced and positioned around the periphery of a core strand. When the inventive yarns are subjected to heat setting temperatures sufficient to melt the heat activated binder fibers, elastic forces stored within the binder fiber are released, pulling and radially constricting the core strand. This radial constraint on the core strand provides the inventive yarn with a more resilient (stiffer) hand, a tighter more defined yarn structure and significantly greater yarn structure retention compared to the prior art Lofquist yarn.

OFFICIAL

We have prepared and evaluated many carpets comparing the inventive yarns with the prior art Lofquist yarns. Carpets prepared from the inventive yarns have shown the following advantages:

- Greater tuft definition
- More uniform tuft appearance
- Firmer carpet feel
- Greater resistance to shedding
- Superior resistance to floor wear.

The inventive yarns have also provided the ability to produce loop pile carpets from staple yarns. This had not previously been practical without radial bonding and the subsequent high levels of bonding we achieved.

I certify that all statements made in this declaration made of my own knowledge are true and all statements made on information and belief are believed to be true.

(Willfully false statements and the like are punishable by fine or imprisonment, or both [18 U.S.C. 1001] and may jeopardize the validity of the application or any patent issuing thereon.)

Charles E. Bowers

Charles E. Bowers
Specialty Materials
Honeywell International
Dalton, GA 30720
March 1, 2002

DECLARATION UNDER 37 U.S.C. 1.132

I presently hold the positions of Associate Dean Academic Programs and Abel C. Lineberger Professor of Yarn Manufacturing at North Carolina State University. I have published more than 120 papers on fiber and textile technology in refereed journals and scholarly publications and have received the Warner Medal from the Textile Institute. I am a chartered associate member of the Textile Institute, and have been a member of the Textile Institute panel for "Textile Terms and Definitions".

I have been asked to comment on the term "blending" as it would be understood in the textile arts. In particular I have been asked whether the process of "blending" would be understood to include the processes of ring spinning or wrap spinning.

Blending is defined by the "Dictionary of Fiber & Textile Technology", Hoechst Celanese Corp., Charlotte, NC 1978 as "The combining of staple fibers of different physical characteristics to assure a uniform distribution throughout the yarn". A further similar definition of blending is available in "Textile Terms and Definitions" (The Textile Institute), which is "A process or processes concerned primarily with the efficient mixing of various lots of fibres. Blending is normally carried out to mix fibres, which may be of different physical properties, market values, or colours." This is a generally accepted definition. In short, blending occurs at the fiber level rather than at the yarn level and is a means of controlling the fiber composition within a yarn. On the other hand, ring spinning and wrap spinning occur at the yarn level and are means of controlling the structure of the yarn.

In my opinion, ring spinning or wrap spinning are not means of "blending" as that term would be understood by one of ordinary skill in the textile arts.

I certify that all statements made in this declaration made of my own knowledge are true and all statements made on information and belief are believed to be true.

(Willfully false statements and the like are punishable by fine or imprisonment, or both [18 U.S.C. 1001] and may jeopardize the validity of the application or any patent issuing thereon.)

William Oxenham

William Oxenham
107 Glen Mavis Court, Cary, NC 27511
March 6, 2002

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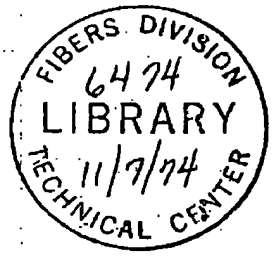

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BLEED. Spreading of loosened or free color into another area or part of a fabric.

BLEEDING. 1. The running of color from wet dyed material onto a white material next to it. 2. When colors run together during certain finishing operations such as washing, scouring, fulling, milling. 3. The dissolving of color during washing.

BLEND. A term used to describe a yarn obtained when two or more fibers are combined in the spinning process.

BLENDED FABRIC. One which contains blended yarns in either the warp or the filling.

BLENDED YARN. Made by mixing two or more fibers before spinning.

BLENDING. 1. The combining of fibers of different colors, such as heather-mixture, or of different types of fibers such as cotton and wool before spinning. 2. Term is used for the dyeing of pale furs to make them more attractive. 3. The mixing of small amounts of same fiber type from many lots, to produce a uniform result.

BLENDING, COTTON. Proper distribution of the stock must be made in the storage bins. The bales, when the ties, bands, covering, and bagging have been removed, must be allowed to open up naturally prior to manipulation. Cotton from one bale should be spread out on the floor of the mixing bin in a thin layer. Then cotton from another bale should be placed on top of the first layer. This procedure continues until the amount desired has been built up. No two bales of cotton that have the same characteristics and properties should be run together, unless absolutely necessary.

BLENDING MACHINE. A group of devices or attachments that are synchronized to proportion definite amounts of various grades or qualities of stocks which are to be blended together. May be used for grades of the same type of fiber, or for a series of different fibers that are to be manipulated.

BLENDING RESERVE. A hopper which provides a uniform flow of cotton to the finisher beater of a single-unit cotton picker machine. This high rectangular box extends the full picker width, and is equipped with elevating aprons to carry the sheet of cotton from the second screen section upward to the cleaning section, where it is dropped into the reserve box.

BLENDS OR COMBINATIONS OF NATURAL, MAN-MADE, AND "SYNTHETIC" FIBERS. These are taking on increasing importance in fabrics of today and tomorrow. Through the use of such combinations, not only is there effective replacement of some of the scarcer natural fibers, but fabrics made from combinations seem to have novel effects and qualities not heretofore possible. The blending of staple fiber with wool, for example, has made possible the production not only of fabrics ideally suited for men's and women's outerwear but also such items for the home as blankets, rugs, decorative fabrics, upholstery.

In these so-called blends, the fibers combined may be any of the natural ones or any of the man-made types in spun or filament forms. These mixtures should not be considered as substitutes but as members of the textile family along with well-established fabrics seen in the market, some for many years.

The actual process of blending may be varied according to the effects which are desired. It is possible to ply the yarns by combining two or more ends which have been previously twisted together. Sometimes the blending is done in connection with the carding process, or a core yarn of one type may be used around which another yarn may be spun. Then, of course, there are many variations which can be obtained through interchanging the content and the kind of warp or filling yarns.

Individual manufacturers may employ one or all of these methods of blending fibers. The results are interesting and seem to be appreciated by the consumer public. They will doubtless play an important part in the future textile world, since some blends in fabrics are of the conservative type, others seem to be rather wild, conspicuous or "shot-about" in surface effect.

While it is generally possible to blend any or all fibers more or less, utmost attention should be given to the experimental work, fabric construction, fabric control, and marketing possibilities.

BLEY. Irish term for unbleached, beetled finish linen.

BLIND CHINTZ. Calendered or glazed chintz used for curtains and coverings.

BLINDING. The change in appearance of a fiber or yarn during dyeing, or some other wet treatment in finishing.

BLIND STITCH. This is used to fasten on trimming or bias bands where the stitch must not show on the right side of the goods. When finishing hems, it is applied by machine.

BLIND TICKING. Broad term for a rugged union fabric of cotton and linen made on a twill weave. Patterns are of single colors or may be striped. Textures vary considerably in this sized cloth resembling bed ticking. Bed ticking, however, is not as a general rule a union in construction.

BLIND TWILL. British term for twill woven cloths in which the twill lines are not easily discernible.

BLISS TWEED. A good quality British woolen on the order of whipcord, used especially for livery and uniform garb.

BLISS TWILL. British term for the 4-up, 2-down twill weave used to make one type of whipcord fabric; the weave is angled at either 63 degrees or 70 degrees.

BLISTERED, PUCKERED. The effect produced when six or more threads form a fancy effect in material because of a light, loose, or uneven warp tension arrangement. The effect simulates seersucker and plissé, crepe, and serpentine.

BLISTER FABRICS. 1. Cotton fabrics which have this effect are:

Two-beam-warp bedspread fabrics, which are made on a Jacquard loom to give the quilted effect; one warp is used for the tension and background effect; the other, known as the slack warp, is used for the quilted effect.

Woven seersucker, made on a tension warp and a slack warp. The effect produced will give a permanent crinkled stripe.

Plissé stripe, a lightweight fabric formed by a shrinking treatment of caustic soda. The effect will flatten out if ironed much. The effect is used on lawn, print cloth and other basic cloths used to simulate woven striped seersucker. Not durable.

Woven matelassé, a cloth which is all cotton or a cotton and rayon material made of regular and crepe-twist yarns woven in dobby designs. The crepe yarns used in the cloth will pucker up in the shrinking process and form the quilted or blister effects.

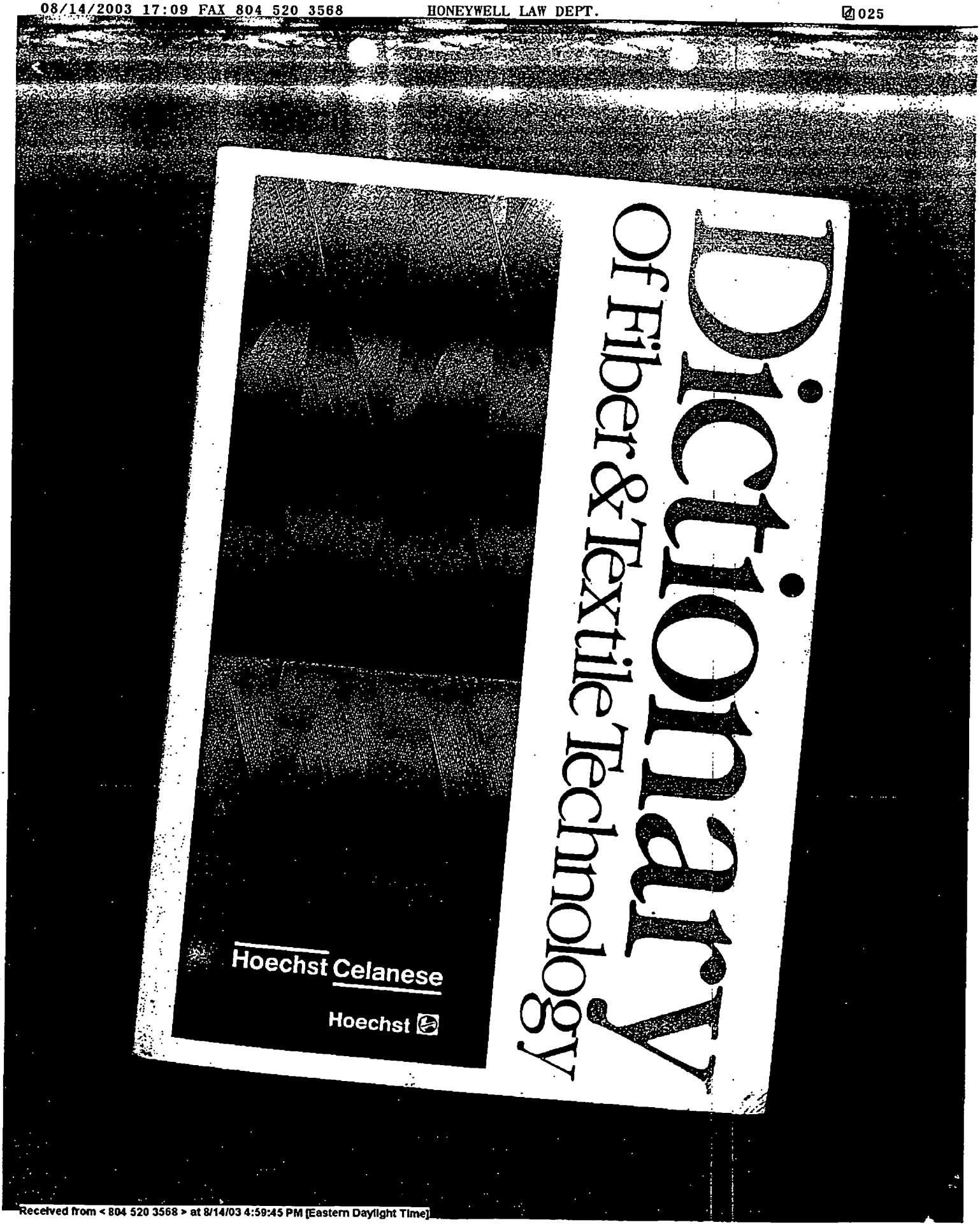
Caustic-soda printed organdy. May have large or small blister-crepe effects.

2. Silk blister material, made on a Jacquard loom because of the opportunity afforded for rather elaborate effects which are popular in some silks.

3. Some "crepe-effect" fabrics developed by careful shrinkage and used in women's wear and in children's garments.

BLOBBY WOOL. Spongy, resilient, full-handle wool.

BLOCK PRINTING. Method of printing by blocks as apart from roller



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Special thanks to the numerous Hoechst Celanese employees who contributed terms and reviewed the changes in this new edition.

BLEB RATE: The frequency of bleb formation in an extrusion operation.

BLEEDING: Loss of color by a fabric or yarn when immersed in water, a solvent, or a similar liquid medium, as a result of improper dyeing or the use of dyes of poor quality. Fabrics that bleed can cause staining of white or light shade fabrics in contact with them while wet.

BLEND: 1. A yarn obtained when two or more staple fibers are combined in a textile process for producing spun yarns (e.g., at opening, carding, or drawing). **2.** A fabric that contains a blended yarn (of the same fiber content) in the warp and filling.

BLENDING: The combining of staple fibers of different physical characteristics to assure a uniform distribution of these fibers throughout the yarn.

BLINDING: Loss of luster of fibers after wet processing.

BLISTER: A bulge resulting from separation of coating or laminating material from the base fabric.

BLOCK PRINTING: See PRINTING.

BLOOM: The appearance of brightness of a dyed fabric when the fabric is viewed across the top while held at eye level.

BLOOMING: See OPENING, 2.

BLOTCH: See FINISHING SPOT.

BLOTCH PRINTING: See PRINTING.

BOARDY: A term used to describe a fabric with a very stiff hand.

BOBBIN: A cylindrical or slightly tapered barrel, with or without flanges, for holding slubbings, rovings, or yarns.

BOBTEX® ICS YARN SYSTEM: A process for producing a simulated spun yarn by embedding individual fibers in a thermoplastic or adhesive coating on a filament yarn.

BODY: The compact, solid, or firm feel of a fabric.

BOILING WATER SHRINKAGE: A test designed to measure shrinkage in a cord, yarn, or high-shrinkage fiber when it is immersed in boiling water while under a tension of 0.05 grams/denier.

BOIL OFF: See SCOURING.

BOLT: A roll or piece of fabric of varying length.

BONDED FABRIC: 1. A fabric containing two or more layers of cloth joined together with resin, rubber, foam, or adhesive to form one ply. **2.** See NONWOVEN FABRIC.

BONDING: 1. A process for adhesive laminating two or more fabrics or fabric and a layer of plastic foam. There are two methods: the flame method used for bonding foam and the adhesive method used for bonding face and backing

fabrics. **2.** One of several processes of binding fibers into thin sheets, webs, or battings by means of adhesives, plastics, or cohesion (self-bonding). (Also see NEEDLED FABRICS and NEEDLE LOOM.)

Bonding with Binder Fibers: Specially engineered low-melting-point fibers are blended with other fibers in a web, so that a uniformly bonded structure can be generated at low temperature by fusion of the binder fiber with adjacent fibers.

Point Bonding: The process o binding thermoplastic fibers into nonwoven fabric by applying hea and pressure so that a discrete pa tern of fiber bonds is formed. Als called spot bonding.

Print Bonding: A process of bin ing fibers into a nonwoven fabric b applying an adhesive in a discrete

Saturation Bonding: A process c soaking the web with an adhesiv

Spray Bonding: A process of binc the spray application of a fabric l

Spray Spinning: See SPUN-BOI

Stitch Bonding: A bonding techr connected by stitches sewn or quilting.

BOND STRENGTH: 1. The amo of woven or knitted fabric from i to break the fusion points found i required to break the chemical crystalline salts. **4.** See PEEL AD

BOOK CLOTH: Print cloth treate in bookbinding.

BOOK FOLD: A method of fold folded in half widthwise, then fc the fold edge on each side is fol equal in length to one-half the